

## Listing networks

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network ls
NETWORK ID          NAME                DRIVER              SCOPE
9dfaa21b29e4        bridge             bridge             local
966593c91bd0        host              host              local
510c710739d4        none              null              local
```

## The default bridge network

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network inspect bridge
[
  {
    "Name": "bridge",
    "Id": "9dfaa21b29e43b396cbf8f7486e80aa1d1975be9fc04d435bf43efe3e547344e",
    "Created": "2021-05-14T06:06:15.5667201Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": null,
      "Config": [
        {
          "Subnet": "172.17.0.0/16",
          "Gateway": "172.17.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {},
    "Options": {
      "com.docker.network.bridge.default_bridge": "true",
      "com.docker.network.bridge.enable_icc": "true",
      "com.docker.network.bridge.enable_ip_masquerade": "true",
      "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
      "com.docker.network.bridge.name": "docker0",
      "com.docker.network.driver.mtu": "1500"
    },
    "Labels": {}
  }
]
```

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d --name dummy davidlanoy/ping:1.0
90c255bc50a706d0e892c50ade563598ab61729bcc3914c2f5b1cf5775734ba3
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network inspect bridge
```

```
[
  {
    "Name": "bridge",
    "Id": "9dfaa21b29e43b396cbf8f7486e80aa1d1975be9fc04d435bf43efe3e547344e",
    "Created": "2021-05-14T06:06:15.5667201Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": null,
      "Config": [
        {
          "Subnet": "172.17.0.0/16",
          "Gateway": "172.17.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {
      "90c255bc50a706d0e892c50ade563598ab61729bcc3914c2f5b1cf5775734ba3": {
        "Name": "dummy",
        "EndpointID": "0b17445a36efaf076c023158c6bae3c9afc600f43d8a14b954d56a9bda869736",
        "MacAddress": "02:42:ac:11:00:02",
        "IPv4Address": "172.17.0.2/16",
        "IPv6Address": ""
      }
    },
    "Options": {
      "com.docker.network.bridge.default_bridge": "true",
      "com.docker.network.bridge.enable_icc": "true",
      "com.docker.network.bridge.enable_ip_masquerade": "true",
      "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
      "com.docker.network.bridge.name": "docker0",
      "com.docker.network.driver.mtu": "1500"
    },
    "Labels": {}
  }
]
```

```

PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d -e PING_TARGET=172.17.0.2 --name pinger davidlanoy/ping:1.0
a480cc67f8631013ebca3dd8ae4ba1d4bcc293a048f62915a9618955f549a3d
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker ps
CONTAINER ID   IMAGE                                COMMAND                                  CREATED          STATUS          PORTS          NAMES
a480cc67f863   davidlanoy/ping:1.0                "sh -c 'ping $PING_T..." 9 seconds ago    Up 8 seconds    pinger
90c255bc50a7   davidlanoy/ping:1.0                "sh -c 'ping $PING_T..." About a minute ago Up About a minute dummy
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker logs pinger
PING 172.17.0.2 (172.17.0.2) 56(84) bytes of data.
64 bytes from 172.17.0.2: icmp_seq=1 ttl=64 time=0.064 ms
64 bytes from 172.17.0.2: icmp_seq=2 ttl=64 time=0.056 ms
64 bytes from 172.17.0.2: icmp_seq=3 ttl=64 time=0.039 ms
64 bytes from 172.17.0.2: icmp_seq=4 ttl=64 time=0.064 ms
64 bytes from 172.17.0.2: icmp_seq=5 ttl=64 time=0.042 ms
64 bytes from 172.17.0.2: icmp_seq=6 ttl=64 time=0.021 ms
64 bytes from 172.17.0.2: icmp_seq=7 ttl=64 time=0.047 ms
64 bytes from 172.17.0.2: icmp_seq=8 ttl=64 time=0.048 ms
64 bytes from 172.17.0.2: icmp_seq=9 ttl=64 time=0.028 ms
64 bytes from 172.17.0.2: icmp_seq=10 ttl=64 time=0.040 ms
64 bytes from 172.17.0.2: icmp_seq=11 ttl=64 time=0.046 ms
64 bytes from 172.17.0.2: icmp_seq=12 ttl=64 time=0.038 ms
64 bytes from 172.17.0.2: icmp_seq=13 ttl=64 time=0.039 ms
64 bytes from 172.17.0.2: icmp_seq=14 ttl=64 time=0.040 ms
64 bytes from 172.17.0.2: icmp_seq=15 ttl=64 time=0.042 ms
64 bytes from 172.17.0.2: icmp_seq=16 ttl=64 time=0.044 ms
64 bytes from 172.17.0.2: icmp_seq=17 ttl=64 time=0.043 ms
64 bytes from 172.17.0.2: icmp_seq=18 ttl=64 time=0.047 ms
64 bytes from 172.17.0.2: icmp_seq=19 ttl=64 time=0.043 ms
64 bytes from 172.17.0.2: icmp_seq=20 ttl=64 time=0.045 ms
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d -e PING_TARGET=dummy --name pinger davidlanoy/ping:1.0
docker: Error response from daemon: Conflict. The container name "/pinger" is already in use by container "a480cc67f8631013ebca3dd8ae4ba1d4bcc293a048f62915a9618955f549a3d". You have to remove (or rename) that container to be able to reuse that name.
See 'docker run --help'.
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker stop pinger
pinger
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d -e PING_TARGET=dummy --name pinger davidlanoy/ping:1.0
7ccdfa31be429dc44037d18636454791cef211f7922c5cc44dd1ba1df4c3ba4c
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker ps
CONTAINER ID   IMAGE                                COMMAND                                  CREATED          STATUS          PORTS          NAMES
90c255bc50a7   davidlanoy/ping:1.0                "sh -c 'ping $PING_T..." 5 minutes ago    Up 5 minutes    dummy
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker stop dummy
dummy
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking>

```

## Managing custom networks

```

PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network create skynet
c38f5f7263e164f1c7aade209d7ad8a625d1e8117f68c2d97571a6beb2750765
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network ls
NETWORK ID     NAME      DRIVER    SCOPE
9dfaa21b29e4   bridge    bridge    local
966593c91bd0   host      host      local
510c710739d4   none      null      local
c38f5f7263e1   skynet    bridge    local
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network inspect skynet
[
  {
    "Name": "skynet",
    "Id": "c38f5f7263e164f1c7aade209d7ad8a625d1e8117f68c2d97571a6beb2750765",
    "Created": "2021-05-14T07:07:39.4757562Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": {},
      "Config": [
        {
          "Subnet": "172.18.0.0/16",
          "Gateway": "172.18.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {},
    "Options": {},
    "Labels": {}
  }
]
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network rm skynet
skynet
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network ls
NETWORK ID     NAME      DRIVER    SCOPE
9dfaa21b29e4   bridge    bridge    local
966593c91bd0   host      host      local
510c710739d4   none      null      local
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking>

```

## Adding containers to a network

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker network create skynet
9831d089dfb2daeddc960d65e8e767f8890320da89bfa351049a70ca1718e6
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d --network skynet --name dummy davidlanoy/ping:1.0
1f2ec5f6ec5fbb5a3a8c79302b15e68939197a10ede9f957e999413a716537f2
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d --network skynet -e PING_TARGET=dummy --name pinger davidlanoy/ping:1.0
af4adf22a672d1250ba87673123dffa0f1f1e45e21c663146ac97cbe54ce0b
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker logs pinger
PING dummy (172.19.0.2) 56(84) bytes of data.
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=1 ttl=64 time=0.064 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=2 ttl=64 time=0.042 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=3 ttl=64 time=0.047 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=4 ttl=64 time=0.049 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=5 ttl=64 time=0.043 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=6 ttl=64 time=0.043 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=7 ttl=64 time=0.045 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=8 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=9 ttl=64 time=0.044 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=10 ttl=64 time=0.044 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=11 ttl=64 time=0.050 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=12 ttl=64 time=0.047 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=13 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=14 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=15 ttl=64 time=0.043 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=16 ttl=64 time=0.024 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=17 ttl=64 time=0.021 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=18 ttl=64 time=0.037 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=19 ttl=64 time=0.028 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=20 ttl=64 time=0.028 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=21 ttl=64 time=0.047 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=22 ttl=64 time=0.047 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=23 ttl=64 time=0.061 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=24 ttl=64 time=0.048 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=25 ttl=64 time=0.050 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=26 ttl=64 time=0.047 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=27 ttl=64 time=0.047 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=28 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=29 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=30 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=31 ttl=64 time=0.049 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=32 ttl=64 time=0.045 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=33 ttl=64 time=0.044 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=34 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=35 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=36 ttl=64 time=0.045 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=37 ttl=64 time=0.044 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=38 ttl=64 time=0.044 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=39 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=40 ttl=64 time=0.044 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=41 ttl=64 time=0.044 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=42 ttl=64 time=0.025 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=43 ttl=64 time=0.049 ms
64 bytes from dummy.skynet (172.19.0.2): icmp_seq=44 ttl=64 time=0.022 ms
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking>
```

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker stop pinger
pinger
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker stop dummy
dummy
```

## Connecting between containers in a network

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d --name widgetdb --network skynet -p 5432 postgres
Unable to find image 'postgres:latest' locally
latest: Pulling from library/postgres
69692152171a: Already exists
a31b993d5cc6: Pull complete
f65921886500: Pull complete
b9c1a94e4ca8: Pull complete
435dd99ceb68: Pull complete
d3ee8e88c67c: Pull complete
84b08674f942: Pull complete
7d358e850d3e: Pull complete
adf2c63307b4: Pull complete
27ff0e95dd24: Pull complete
550e7b1ab95a: Pull complete
2287baf15ef8: Pull complete
97d11a196325: Pull complete
0f11fc82fe79: Pull complete
Digest: sha256:0eee5caa50478ef50b89062903a5b901eb818dfd577d2be6800a4735af75e53f
Status: Downloaded newer image for postgres:latest
33ea88b566960ee68687706cc7569d7a175e6fcb6ab067be4a0beb041f6c845
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d --name gadgetdb --network skynet -p 5432 postgres
f4f4f598c4c2c2b6c577e494803f10ff648721619348b06e89159ab2894199
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
```

*\*container exits automatically due to error below (removed “-rm” tag to view logs of container)*

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker container logs 2dd
5432 postgres
Error: Database is uninitialized and superuser password is not specified.
You must specify POSTGRES_PASSWORD to a non-empty value for the
superuser. For example, "-e POSTGRES_PASSWORD=password" on "docker run".

You may also use "POSTGRES_HOST_AUTH_METHOD=trust" to allow all
connections without a password. This is *not* recommended.

See PostgreSQL documentation about "trust":
https://www.postgresql.org/docs/current/auth-trust.html
```

*\*added -e POSTGRES\_PASSWORD=password as temp password for the purpose of activity*

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d -e POSTGRES_PASSWORD=password --name widgetdb --network skynet -p
5432 postgres
c6c7bdb13085db9a52658ca1ad7d07c37cfa55e0a2d1663fe55ac9d694894edb
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d -e POSTGRES_PASSWORD=password --name gadgetdb --network skynet -p
5432 postgres
1f9b69cb9efd127c90e5068e3828636e732c807156aa99c32e71b9fc4d5fdfe
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking>
```

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker exec -it widgetdb /bin/bash
root@c6c7bdb13085:/# psql -U postgres
psql (13.2 (Debian 13.2-1.pgdg100+1))
Type "help" for help.

postgres=# \q
root@c6c7bdb13085:/# psql -U postgres -h gadgetdb
Password for user postgres:
psql (13.2 (Debian 13.2-1.pgdg100+1))
Type "help" for help.

postgres=# \q
root@c6c7bdb13085:/# exit
exit
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking>
```

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker stop widgetdb gadgetdb
widgetdb
gadgetdb
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS          NAMES
a6d3924ff672   11ec917c9e0e   "sh -c 'ping $PING_T..." 44 hours ago   Exited (0)    44 hours ago   tender_wiles
904bc169c13d   ubuntu:16.04   "/bin/bash"              45 hours ago   Exited (0)    45 hours ago   wizardly_sanderson
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking>
```

## Building ports to the host

```
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker run --rm -d -e POSTGRES_PASSWORD=password --name widgetdb --network skynet -p
5432:5432 postgres
7a24c1f4264d5d09fa6ede2657c468c9b27b3e792619d8083e74e4e7c136b18c
PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> psql -U postgres -h localhost
psql : The term 'psql' is not recognized as the name of a cmdlet, function, script file, or operable program. Check the spelling of the name, or if a path
was included, verify that the path is correct and try again.
At line:1 char:1
+ psql -U postgres -h localhost
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (psql:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS N:\up-3y2s\coe197s\repos\me8_containerization_and_docker\6-networking> docker stop widgetdb
widgetdb
```